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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/229,628 01/13/99 SAKAINO Y OKI-4646.01

MMC2/0913

EXAMINER

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CAO, E

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 09/13/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

## Office Action Summary

Application No. 09/229,628	App. Int(s) Sakaino et al.
Examiner Phat X. Cao	Group Art Unit 2814

- Responsive to communication(s) filed on \_\_\_\_\_.  
 This action is FINAL.  
 Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

### Disposition of Claims

- Claim(s) 1-15 is/are pending in the application.  
Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 Claim(s) 6-15 is/are allowed.  
 Claim(s) 1-5 is/are rejected.  
 Claim(s) \_\_\_\_\_ is/are objected to.  
 Claims \_\_\_\_\_ are subject to restriction or election requirement.

### Application Papers

- See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.  
 The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.  
 The proposed drawing correction, filed on \_\_\_\_\_ is  approved  disapproved.  
 The specification is objected to by the Examiner.  
 The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119

- Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).  
 All  Some\*  None of the CERTIFIED copies of the priority documents have been  
     received.  
     received in Application No. (Series Code/Serial Number) \_\_\_\_\_.  
     received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \*Certified copies not received: \_\_\_\_\_.
- Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

### Attachment(s)

- Notice of References Cited, PTO-892  
 Information Disclosure Statement(s), PTO-1449, Paper No(s). 2  
 Interview Summary, PTO-413  
 Notice of Draftsperson's Patent Drawing Review, PTO-948  
 Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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## **DETAILED ACTION**

### ***Specification***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
2. The disclosure is objected to because of the following informalities:
  - on page 3, line 6, a word "Fig. 4" should be changed to "Fig. 4(A) - 4(B)."
  - on page 3, line 8, a word "Fig. 6" should be changed to "Figs. 6(A) - 6(B)."
  - on page 5, line 20, a phrase "current will flow in either of the first wiring layer of the second wiring layer ..." should be changed to "current will flow in either of the first wiring layer or the second wiring layer..."

Appropriate correction is required.

### ***Oath/Declaration***

3. The oath/declaration is defective because the filing date of Foreign application 10-021021 in the oath/declaration is incorrect. The filing date of Foreign application 10-021021 should be 02/02/1998, but not 1/23/1998.

### ***Drawings***

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4. Figures 4(A) - 4(B) should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

5. The applicant is requested to provide the source for the related art disclosed in Figs. 4(A) - 4(B).

***Claim Rejections - 35 USC § 112***

6. Claims 3-5 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 3, lines 11-12, the subject matter of having the total number of contact holes being respectively different between the first contact hole group and the third contact hole group is not described in the specification. Similarly, in claim 3, lines 13-14, the subject matter of having a total number of contact holes being respectively different between the second contact hole group and the fourth contact group is not described in the specification. Evidently, Fig. 1 of Applicant's drawing discloses the total number of contact holes 101 in the first contact hole group (see contact hole 101 on left hand side) is the same as (but not different) the total number of contact holes 101 in the third contact hole group (see contact hole 101 on the right hand side), and the total number of contact holes 104 in the second contact hole group (see contact hole 104

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on the left hand side) is the same as (but not different) the total number of contact holes 104 in the fourth contact hole group (see contact hole 104 on the right hand side).

- claims 4-5 are rejected because they depend on rejected independent claim 3.

7. Claims 1, 4 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- claim 1 recites the limitation "said impurity diffusion region" in lines 7-8 to describe a single impurity diffusion region . There is insufficient antecedent basis for this limitation in the claim.

- claim 4 is unclear. Claim 4 depends on claim 3 but claim 4 is conflict to claim 3. Claim 3, lines 11-12 states that "a total number of contact holes is respectively different between said first contact hole group and said third contact hole group", in contrast, claim 4, lines 18-19, states that "the total number of contact holes in said first contact hole group is the same as the total number of contact holes in said third contact hole group."

- claim 5 is rejected because it depends on rejected claim 4.

### *Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ando (JP. 6-232345 A) in view of Narita (US. 5,844,281).

With respect to claim 1, Ando discloses in abstract and Figs. 1(a) and 1(b) a semiconductor integrated circuit device, comprising: impurity diffusion regions 103 formed as source and drain on a semiconductor substrate; a first conductive layer 104 having a first resistivity formed on the impurity diffusions 103; a first contact hole group 106 connecting the first conductive layer 104 and the impurity diffusion region 103; a second conductive layer 102 having a second resistivity formed on the first conductive layer 104; and a second contact hole group 105 connecting the first conductive layer 104 and the second conductive layer 102 at an upper part of the impurity diffusion region 103, wherein the first conductive layer 104 made of a high-resistance material (see abstract).

Ando does not specifically disclose that a total number of holes in the first contact hole group 106 is different or more than a total number of holes in the second contact hole group 102.

However, Narita ('281) teaches in Fig. 2 the obviousness of forming a first conductive layer 11 made of polysilicon (column 5, lines 35-40) and having resistivity higher than resistivity of second conductive layer 3 made of aluminum (column 5, lines 21-22), and the forming of a total number of holes in the first contact hole group 72 being different or more than a total number of holes in the second contact hole group 71.

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Given the above teachings, it would have been obvious to one of ordinary skill in the art to modify the device structure of Ando by forming a total number of holes in the first contact hole group being more than a total number of holes in the second contact hole group for the purpose of preventing the breakdown of diffusion layer by limiting the current flowing through the total number of holes in the first contact hole group, such as taught by Narita (column 5, lines 31-35).

With respect to claim 2, Ando discloses the first conductive layer 104 made of a high resistance material (see abstract), but Ando does not disclose the material of the first conductive layer 104 having resistivity higher than the resistivity of the material of the second conductive layer 102.

However, as discussed above, Narita ('281) teaches in Fig. 2 the obviousness of forming a first conductive layer 11 made of polysilicon (column 5, lines 35-40) and a second conductive layer 3 made of aluminum (column 5, lines 21-22). And as is well known, polysilicon has a resistivity higher than the resistivity of aluminum. Accordingly, it would have been obvious to one of ordinary skill in the art to form the first conductive layer of Ando having the resistivity higher than the resistivity of the second conductive layer, in view of teaching of Narita, because the higher resistivity of the first conductive layer would also contribute to the benefits of preventing the breakdown of diffusion layer by limiting the current flowing through the high resistivity first conductive layer, such as taught by Narita (column 5, lines 31-35).

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***Allowable Subject Matter***

10. Claims 6-15 are allowed.

The prior art fails to disclose all the limitations recited in the above claims, including the first contact hole group having a plurality of contact holes arranged between neighboring contact holes of the second contact hole group, and the third contact hole group having a plurality of contact holes arranged between neighboring contact holes of the fourth contact hole group.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is (703) 308-4917. The Examiner can normally be reached on Monday through Thursday. If attempts to reach the Examiner by telephone are unsuccessfully, the Examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. Group 2800 fax number is (703) 308-7722 or (703) 308-7724.

PC  
September 11, 2000

  
Cao, Phat X.  
Patent Examiner  
Technology Center 2800